

PELICAN CREEK BRIDGE  
Yellowstone Roads and Bridges  
Spanning Pelican Creek on East Entrance Road  
Yellowstone National Park  
Teton County  
Wyoming

HAER No. WY-49

HAER  
WYO  
20-YELNAP,  
8-

BLACK & WHITE PHOTOGRAPHS  
WRITTEN HISTORICAL & DESCRIPTIVE DATA

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HISTORIC AMERICAN ENGINEERING RECORD

PELICAN CREEK BRIDGE

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**Location:** Spanning Pelican Creek on East Entrance Road, 1.6 miles east of Lake Junction, Yellowstone National Park, Teton County, Wyoming  
UTM: Canyon Village, WY, Quad. 12/551150/4933950

**Date of Construction:** 1935

**Owner:** Yellowstone National Park, National Park Service

**Use:** Vehicular bridge

**Designer:** Architectural plans by W.G. Carnes, Branch of Plans and Design, National Park Service  
General plans and specifications by G.M. Williams, Bureau of Public Roads

**Builder:** Undetermined

**Significance:** Pelican Creek Bridge typifies the early design philosophy of the National Park Service, which was to use indigenous materials to harmonize man-made features with their natural surroundings. This philosophy is embodied in many of the park's Rustic Style buildings and structures.

**Project Information:** Documentation of Pelican Creek Bridge is part of the Yellowstone Roads and Bridges Recording Project, conducted during the summer of 1989 by the Historic American Engineering Record, a division of the National Park Service, under the co-sponsorship of Yellowstone National Park, the NPS Roads and Bridges Program, and the NPS Rocky Mountain Regional Office, Denver. Historical research and written narrative by Mary Shivers Culpin, Historian, NPS Rocky Mountain Regional Office. Engineering description by Steven M. Varner, Virginia Polytechnic Institute. Edited and transmitted by Lola Bennett, HAER Historian, 1993.

## HISTORY OF EAST ENTRANCE ROAD

(See HAER WY-25, Cub Creek Bridge.)

## DESIGN AND CONSTRUCTION OF PELICAN CREEK BRIDGE

Pelican Creek Bridge was built in 1934 as part of a major reconstruction and relocation of East Entrance Road. The bridge replaced a 192-foot wooden pile bridge that had been constructed by the U.S. Army Corps of Engineers in 1902. The new Pelican Creek Bridge is a three-span concrete girder with a continuous concrete slab, and concrete piers and abutments on timber pilings. The maximum span length of the three spans is 52'-6". The flanking spans are 42'-4½". The span length is measured from center of support to center of support. The structure length is 196'-10" from end of wing wall to end of wing wall. The deck width is 27' while the bridge roadway from curb to curb is 24' wide.<sup>1</sup>

The concrete in the deck is class "D". "D" refers to the proportion of cement in the mix. "A" has the highest proportion of cement in the concrete which makes the strongest concrete. The curb and slab were poured monolithically. The maximum size of aggregate in the slab is 1½". The concrete slab is arched with a radius of 72'-1" on the flanking spans and a radius of 108'-2" on the center span. The longitudinal reinforcing steel bars in the slab are different from the flanking and midspans and the top and bottom of the slab. Starting at the beginning of the bridge on the top are 1½"-diameter bars, 12" on center, going to 1¼"-diameter bars, 6" on center, going to 1¼"-diameter bars, 12" on center, in the third of the bridge by the pier. For the midspan, the first third of the bridge has 1"-diameter bars at 6" on center on top, and 1"-diameter bars at 12" on center on the bottom. This changes to 1"-diameter bars at 12" on center on top and 1"-diameter bars at 6" on center on the bottom in the center third of the midspan. Over the piers there is a second top row of ¾"-diameter bars at 12" on center. The end span of the bridge is reinforced longitudinally like the first span. The transverse bars consist of ½"-diameter bars 2' on center at the top and bottom. The deck is 2' thick with a 1½"-inch crown. The curb rises 9" above the deck and is 18" thick. The curb and volume underneath the curb are reinforced with ¾"-diameter hoops 18" on center.<sup>2</sup>

The guard rail consists of a 10"-diameter log post rising 3'-1" above the curb and sunk into an 8"-diameter pipe sleeve sunk into the curb 1'-6". An 8"-diameter log rail is attached near the top of the posts on the roadway side with its bolt countersunk on the roadway side. The posts are 7'-3½" on center.<sup>3</sup>

The piers of this bridge have vertical and horizontal reinforcement near their perimeters of ½"-inch diameter. A pier rests on thirty-six pilings laid out on 3'-3" x 3'-3" grid. The pilings are approximately 9" in diameter. The piers rise 5'-6" from a normal water elevation of 7,732 feet. Pier one, the west pier, is 18'-3" high, while pier two, the east pier, is 14'-3" high. Both piers are 9'-0" thick at the bottom and 5'-6" thick at the top. They begin to taper at about the normal water level. Above the normal water level the piers take on a sort of barbell shape in both the horizontal and vertical sections. A bearing beam consisting of half an 8-inch WF section at 67 pounds per foot is just buried in the concrete along the pier center line.<sup>4</sup>

The abutments are U-shaped with wing walls extending 26'-6" from the beginning and end of the bridge. The wing walls are 15'-7½" high along their entire length. Like the piers, the abutments and wing walls have horizontal and vertical reinforcement near their perimeters. The abutments and wing walls rest on spread footings on fifty-four pilings approximately 9" in diameter. The abutment has a bearing beam for the deck to rest on in the form of half of an 8-inch WF section at 58 pounds per foot just buried in the concrete at the bridge seat.<sup>5</sup>

The estimated material quantities for the bridge were as follows:

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Class "A" concrete.....	355 cu. yds.
Class "B" concrete.....	187 cu. yds.
Class "D" concrete.....	458 cu. yds.
Class "S" concrete.....	110 cu. yds.
Reinforcing steel.....	77,000 lbs.
Timber piling.....	4,550 lin. ft.
Structure excavation.....	850 cu. yds.
Structural steel.....	7,700 lbs. <sup>6</sup>

In 1986 Pelican Creek Bridge was considered to be in very poor condition. Severe deterioration and spalling was occurring on the weather exposed concrete faces.<sup>7</sup>

ENDNOTES

1.U. S. Department of Transportation, Federal Highway Administration, Western District, Bridge Inspection Report, Pelican Creek Bridge, August 11, 1986.

2.U. S. Department of Agriculture, Bureau of Public Roads, Pelican Creek Bridge Plans, February, 1934.

3.Ibid.

4.Ibid.

5.Ibid.

6.Ibid.

7."Yellowstone National Park Parkwide Road Engineering Study 1986."